Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Resistance Thermometers

Ignition Protection Exd

KOBOLD

measuring • monitoring • analysing

TWL-Exd

- Measuring range: -80 ... +600 °C
- Pt 100-sensor class A respectively class B
- Output: Resistance or analogue 4-20 mA
- Thermowells up to 1000, 3000 respectively 5000 mm (depending on model)
- Option: Headtransmitter with HART®-protocol or PROFIBUS®/Fieldbus, display
- For ATEX applications, ignition protection Exd

T2

KOBOLD companies worldwide:

ARGENTINA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, DOMINICAN REPUBLIC, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, ROMANIA, SINGAPORE, SOUTH KOREA, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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Description

The KOBOLD resistance thermometers comprise a rugged installation fitting made of stainless steel with thread, flange or weld-on connection, a connection head out of aluminium casting and a removable measuring element. The measuring insert can be replaced without emptying the installation, since the customised thermowell remains in the installation and seals the process. The instruments are supplied with the ignition protection Exd as a standard and therefore can be installed in relevant hazardous areas.

A Pt100 temperature sensor according to IEC 751, category A or B is fitted in the measuring insert as standard. Depending on customer request the temperature sensor can be carried out as 2-, 3- or 4-wire circuit.

Alternatively these sensors can be designed as single or double resistance thermometers. Exceptional the 4-wire version, which can only be build with one Pt100 due to lack of space.

As an option the resistance thermometers can be supplied with a head transmitter. Transmitter with a standard 4-20 mA signal, with HART® protocol or with PROFIBUS®/Fieldbus® are there to choose from.

Beside the available resistance thermometers according to DIN-standard, there are customised versions relating to the immersion length, the connection head, the materials, the process connection or the tolerance classes deliverable on request.

Head Transmitter

Resistance thermometers with head transmitter are used whenever a measuring signal must be transported long distance without any disturbance.

The head transmitter which is encapsulated in epoxide resin is located right in the connection head and delivers a temperature-linear output signal of 4-20 mA. The head transmitter is available with standardised communication systems just like HART® protocol or PROFIBUS®/Fieldbus®.

Applications

The resistance thermometers with thread-, flange- or weld-on connection are favourably used for the temperature measurement in liquids, solids and gaseous media. The reliable watertightness of these installation methods for gauge pressure and vacuum is an important criteria for selection.

Application areas are located in the air-conditioning and cooling industry, the heating-, furnace-, mechanical- and apparatus-construction as well as in the complete industry.

For all applications in hazardous areas, the instruments are supplied with the ignition protection Exd.

Technical Data

Meas. principle:	Temperature depending resistor
Meas. range:	-30 … +550 °C or -80 … +600 °C (others on request)
Sensor:	Pt 100 single- or double-sensor (1 x Pt100 or 2 x Pt100)
Accuracy:	Class A or class B (others on request)
Ambient temperature:	-40 … +150 °C with ceramic terminal base (without transmitter) -40 … +85 °C (with transmitter) -20 … +70 °C (with LCD display) -20 … +80 °C (with LED display)
Operating pressure:	Up to 250 bar (depending on thermowell) TWL-1: pressureless TWL-3 and sensors without thermowell atmospheric pressure
Connection head:	Form XD with chain (no chain with optional display)
Cable entry:	M 20 x 1.5 standard (others on request)
Materials:	
- Sensor:	Stainless steel 1.4404
- Thermowell:	Stainless steel 1.4404 (others on request)
- Neckpipe:	Stainless steel 1.4404
- Connection head:	Aluminium, painted
- Terminal base:	Ceramic (without transmitter)
Process connection:	
- Thread:	G ½ male, G ¾ male, G1 male, ½" NPT, ¾" NPT, 1" NPT
- DIN-flange:	DN 15, 20, 25, 32, 40, 50
- ANSI flange:	½", ¾", 1", 1 ½", 2"
- Weld-in	¾", 1", 1 ¼"
Sensor wiring:	2-, 3- or 4-wire
Output:	Resistance value
Protection:	Connection head IP 54…68 depending on cable gland and sealing sensor IP 68

1/02-2015

Technical Data (continued)

ATEX-approval: ⟨Ex⟩ II 2 GD Ex d IIC T6

Head transmitter:

- Output: Analogue output 4-20 mA
- Communication: HART®-protocol, PROFIBUS®/Fieldbus
- Minimum meas. span: Standard transmitter 25 °K
  transmitter with HART® 10 °K
  transmitter with PROFIBUS®/Fieldbus 5 °K
- Supply voltage: 8 - 35 V_{DC} for standard transmitter and transmitter with HART®
  9 - 32 V_{DC} for transmitter with PROFIBUS®/Fieldbus

Display:

- Type: 4 digit LCD or LED
- Supply: loop powered
- Voltage drop out: LCD max. 2.5 V
  LED 3.3 V at 4 mA
  3.7 V at 20 mA

Order Details (example: **TWL-1 1 2 L N D N 5 C A 1**)

Model	Sensor specification				
	Type	**Sensor type / class**	**Sensor wiring**	**Connection head / transmitter**	**Process connection of sensor**
TWL-	**0** = without	**0** = without **1** = 1 x Pt100, class B (-30…+550 °C) **2** = 2 x Pt100, class B (-30…+550 °C) **3** = 1 x Pt100, class B (-80…+600 °C) **4** = 2 x Pt100, class B (-80…+600 °C) **5** = 1 x Pt100, class A (-30…+550 °C) **6** = 2 x Pt100, class A (-30…+550 °C) **7** = 1 x Pt100, class A (-80…+600 °C) **8** = 2 x Pt100, class A (-80…+600 °C) **X** = special	**0** = without	**0** = without (for TWL-0/3)	
	1 = standard **2** = with nipple union		**2** = 2-wire **3** = 3-wire **4** [1] = 4-wire	**L** [6] = ATEX Exd / without transmitter **A** [7][8] = ATEX Exd / programmable 2-wire transmitter **B** [7][8] = ATEX Exd / programmable 2-wire transmitter with HART® protocol **C** [6][7] = ATEX Exd / transmitter with PROFIBUS® / Fieldbus® **X** = special option (specify in clear text) for options A, B, C choose sensor wiring code "3"	**N** [2] = ½" NPT male **G** = G ½ male **X** = special
	3 = measuring insert				**0** = without

[1] 4-wire only for 1 sensor
[2] choose "N" for TWL-2
[6] Display only available for 4 ... 20 mA or Hart® transmitters. Choose transmitter code A or B
[7] Please specify the measuring range in clear text while ordering
[8] Separate programming kit needed

Order Details (continued)

Thermowell specification				Length (sensor, thermowell, measuring insert)[4] (see drawings)	Options
Thermowell type	**Process connection**	**Process connection size**	**Nominal pressure (process connection)**		
0 = without **B** = cylindrical, multipart, welded **G** = cylindrical, bar stock/drilled with stepped shank **D** = tapered shank, bar stock/drilled **X** = special option	**0** = without (for TWL-3)	**0** = without (for TWL-3)	**0** = without (for TWL-3)	**only for TWL-0** (only thermowell) **0** = without lagging extension "T" **1** = with lagging extension "T" **sensor with thermowells** (only for TWL-1/TWL-2) **A** = with standard neckpipe "HL"/ without lagging extension "T" **B** = with standard neckpipe "HL" and with lagging ext. "T" **C**[5] = without neckpipe "HL"/ with lagging extension "T" **D**[5] = without neckpipe "HL"/ without lagging extension "T" **E** = with special neckpipe length "HL"/ with lagging ext. "T" **F** = with special neckpipe length "HL"/ without lagging ext. "T" **sensor without thermowells** (only for TWL-1/TWL-2) **G** = with standard neckpipe length "HL" **H** = with special neckpipe length "HL" **J** = without neckpipe "HL" **X** = special option (specify in clear text)	**0** = without **1**[6] = with LCD display **2**[6] = with LED display **Y** = special option (specify in clear text)
	G = G-thread **N** = NPT-thread	**4** = ½" (not for thermowell D) **5** = ¾" **6** = 1" **X** = special	**A** = PN 25 (only for thermowell B) **B** = PN 100 (only for thermowell G) **C** = PN 250 (only for thermowell D)		
	S[3] = welded	**5** = ¾", only for thermowell G **6** = 1" **7** = 1 ¼", only for thermowell D **X** = special	**B** = PN 100 (only for thermowell G) **C** = PN 250 (only for thermowell D)		
	F = DIN flange	**4** = DN 15 (not for thermo-well G/D) **5** = DN 20 **6** = DN 25 **7** = DN 32 **8** = DN 40 **9** = DN 50 **X** = special	**1** = PN 6 **2** = PN 16 **3** = PN 40 **4** = PN 100 (not for DN 15) **X** = special		
	A = ANSI flange	**4** = ½" (not for thermowell G/D **5** = ¾" **6** = 1" **8** = 1 ½" **9** = 2" **X** = special	**5** = 150 lbs **6** = 300 lbs **7** = 600 lbs (not for ½") **8** = 900 lbs (not for ½") **9** = 1500 lbs (not for ½") **X** = special	**M** = measuring insert (only for TWL-3, specify length "ML")	

[3] not for thermowell type B

[4] Immersion length "**U**" and hole diameter "**i**" (when ordering a/with thermowell) or "**EL**" (when ordering without thermowell), neckpipe length "**HL**" (when different from stdd. i.e. for TWL-1 stdd. is 130 mm, for TWL-2 standard is 150 mm), lagging extension "**T**" (if ordered) and measuring insert length "**ML**" (when ordering TWL-3) must be specified in clear text when ordering.
Pls. check lengths very precisely in order to ensure a perfect match between sensor and thermowell.

[5] not for TWL-2

[6] Display only available for 4 ... 20 mA or Hart® transmitters. Choose transmitter code A or B

Note: *Nominal pressure for TWL-3 and sensors without thermowell is atmospheric pressure.*

Order Details for Ordering only the Thermowell (example: **TWL-0000NBG4000**)

Model	Sensor type	Sensor type/class	Sensor Wiring	Connection head / transmitter	Process connection of temperature sensor[1)]
TWL-	**0** = without	**0** = without	**0** = without	**0** = without	**N**[1)] = ½" NPT male **G** = G ½ male **X** = special

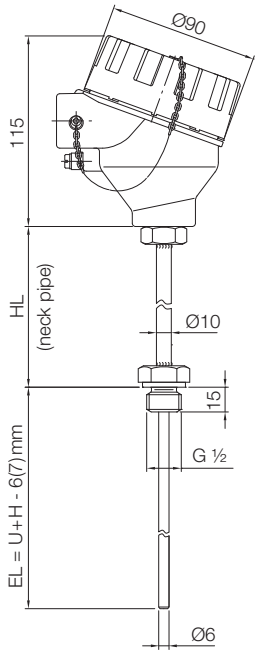
[1)] choose N for nipple and union version

Order Details for Ordering only the Thermowell (continued)

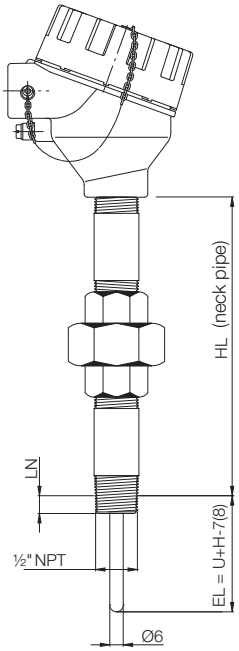
Thermowell specification				Immersion length and lagging extension length [1)]	Special option
Thermowell type	Process connection size	Nominal pressure (process connection)	Pressure rating for flange connection		
Please use the specification codes according to order table shown on page 4				**0** = without lagging extension "T" **1** = with lagging extension "T"	**0** = without **Y** = option acc. specification

[1)] Immersion length "**U**", hole diameter "**i**" and lagging extension "**T**" must be specified in writing.
Please check lengths very precise in order to ensure a perfect match of sensor and thermowell.

Dimensions Temperature Sensor TWL-1
Illustration without thermowell*



Dimensions Temperature Sensor TWL-2
Illustration without thermowell*

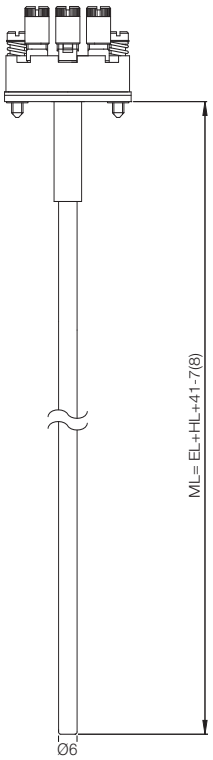


HL = neckpipe length
standard 130 mm for TWL-1
standard 150 mm for TWL-2
EL = immersion length
EL = U+H-7 mm for thermowell type B
U+H-8 mm for thermowell type G/D

U = immersion length thermowell (see drawing thermowell)
H = length see thermowell
LN = screw-in-length by hand (approx. 8.1 mm at ½" NPT)

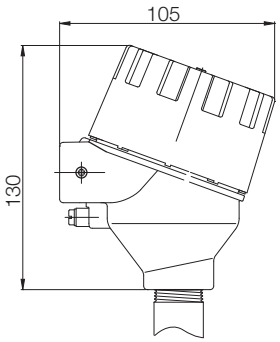
* For Ex-applications an adequate thermowell is needed

Dimensions Measuring Insert TWL-3

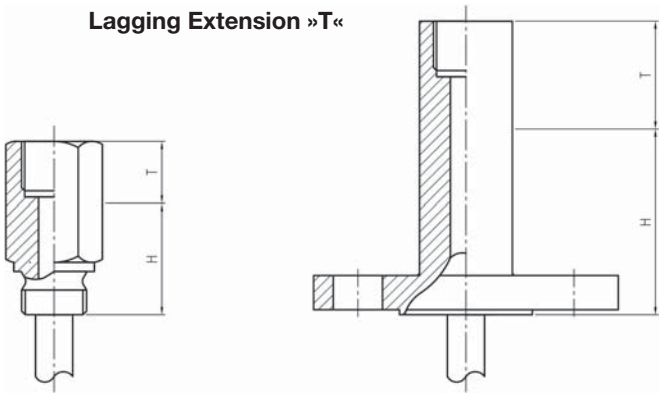


HL = neckpipe length
EL = immersion length
ML= measuring insert length

Dimensions Connection Head with Display

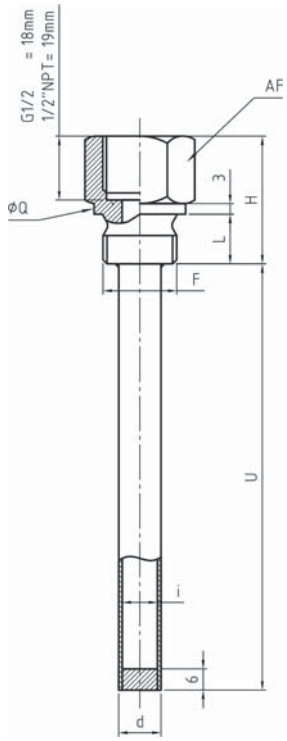


Lagging Extension »T«



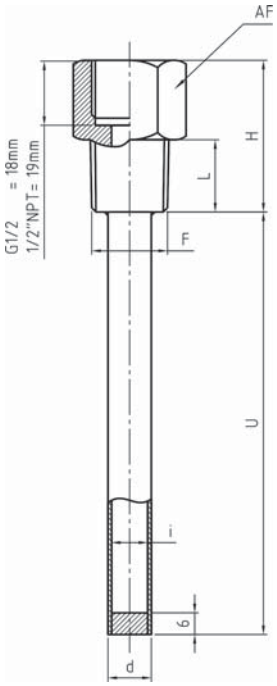
Dimensions Thermowell »B«

Cylindrical thermowell, welded, with process connection G-thread (max. PN 25 at 20 °C)



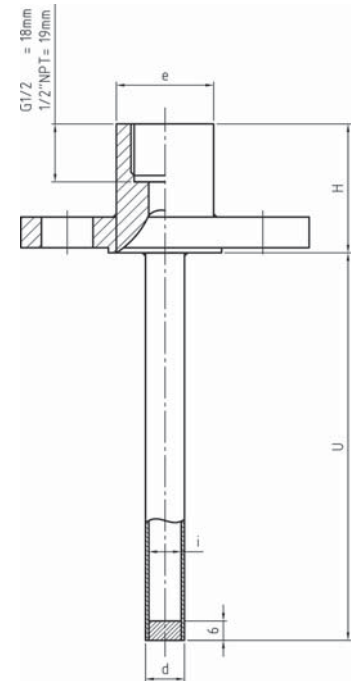
Process connection	Max. total length	AF	F	i	d	H	L	Q
G-thread	5000 mm	27	G ½ B	10	12	36	14	26
				12	14			
		36	G ¾ B	10	12	38	16	31.7
				12	14			
		41	G 1 B	10	12	40	18	39
				12	14			

Cylindrical thermowell, welded, with process connection NPT-thread (max. PN 25 at 20 °C)



Process connection	Max. total length	AF	F	i	d	H	L
NPT-thread	5000 mm	27	½" NPT	10	12	42	20
				12	14		
		27	¾" NPT	10	12	43	20
				12	14		
		36	1" NPT	10	12	46	24
				12	14		

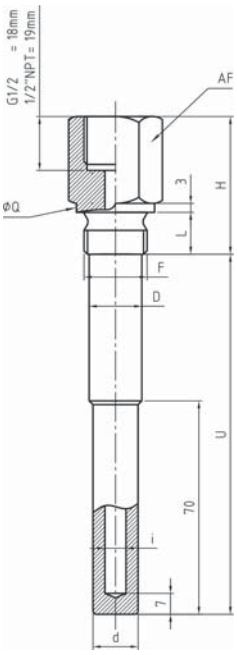
Cylindrical thermowell, welded, with process connection flange acc. DIN or ANSI (max. PN 6…40 at 20 °C)



Process connection		Max. total length	i	d	H	e
with flange	ANSI ½"	5000 mm	10/12	12/14	40	30
	ANSI ¾"					
	ANSI 1"					
	ANSI 1 ½"					35
	ANSI 2"					
	DIN DN 15		10/12	12/14	40	30
	DIN DN 20					
	DIN DN 25					
	DIN DN 32					35
	DIN DN 40					
	DIN DN 50					

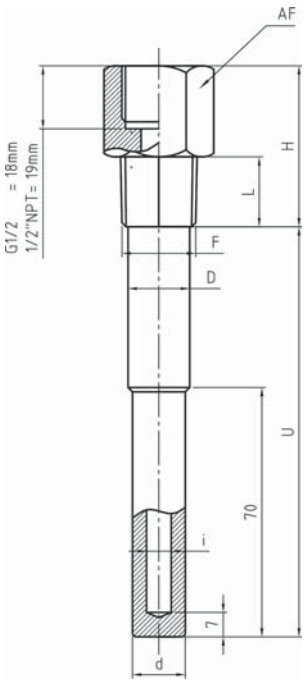
Dimensions Thermowell Model TWL-…G…

Cylindrical thermowell, bar stock/drilled with
stepped shank and process connection G-thread
(max. PN 100 at 20 °C)



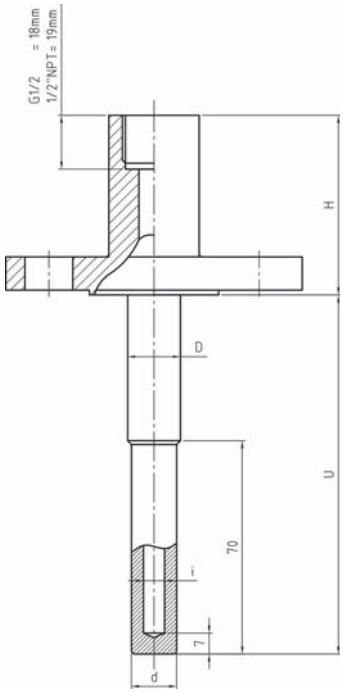
Process connection	Max. total length	AF	F	i	d	D	H	L	Q
G-thread	1000 mm	27	G ½ B	7-8-9	15	17.5	46	14 for ½	26
				10-12	17.5	17.5			
		36	G ¾ B	7-8-9	15	18		16 for ¾	31.7
				10-12	18	21			
		41	G 1 B	7-8-9	15	21	51	18 for 1"	39
				10-12	18	25			

Cylindrical thermowell, bar stock/drilled with
stepped shank and process connection NPT-thread
(max. PN 100 at 20 °C)



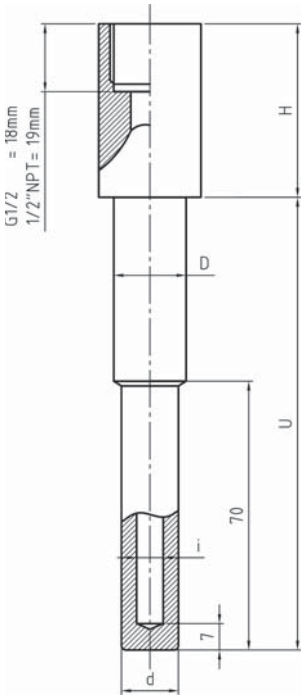
Process connection	Max. total length	AF	F	i	d	D	H	L
NPT-thread	1000 mm	27	½" NPT	7-8-9	15	17.5	46	20
				10-12	17.5	17.5		
		27	¾" NPT	7-8-9	15	18		
				10-12	18	21		
		36	1" NPT	7-8-9	15	21	51	24
				10-12	18	25		

Cylindrical thermowell, bar stock/drilled with stepped shank
and process connection flange acc. DIN or ANSI
(max. PN 100 at 20 °C)



Process connection		Max. total length	i	d	D	H	e
flange	ANSI ¾"	1000 mm	7-8-9	15	17.5	60	30
			10-12	17.5	17.5		
	ANSI 1"		7-8-9	15	18		
			10-12	18	21		
	ANSI 1½"		7-8-9	15	21		35
			10-12	18	25		
	ANSI 2"		7-8-9	15	21		
			10-12	18	25		
	DIN DN 20		7-8-9	15	17.5	60	30
			10-12	17.5	17.5		
	DIN DN 25		7-8-9	15	18		
			10-12	18	21		
	DIN DN 32		7-8-9	15	21		35
			10-12	18	25		
	DIN DN 40		7-8-9	15	21		
			10-12	18	25		
	DIN DN 50		7-8-9	15	21		
			10-12	18	25		

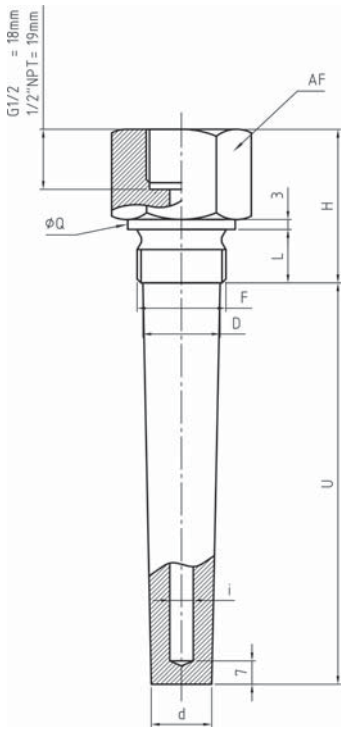
Cylindrical thermowell, bar stock/drilled with stepped shank
and process connection for weld-on (max. PN 100 at 20 °C)



Process connection		Max. total length	F	i	d	D	H
for weld-on	DN ¾"	1000 mm	26.9	7-8-9	15	19	46
				10-12	18		
	DN 1"		33.4	7-8-9	15	22	51
				10-12	18		

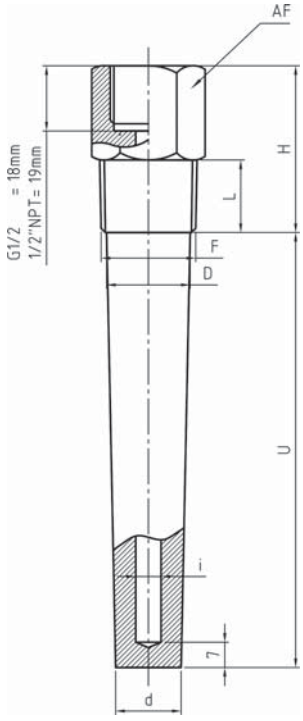
Dimensions Thermowell Model TWL-…D…

Tapered shank, bar stock/drilled thermowell with
process connection G-thread (max. PN 250 at 20 °C)



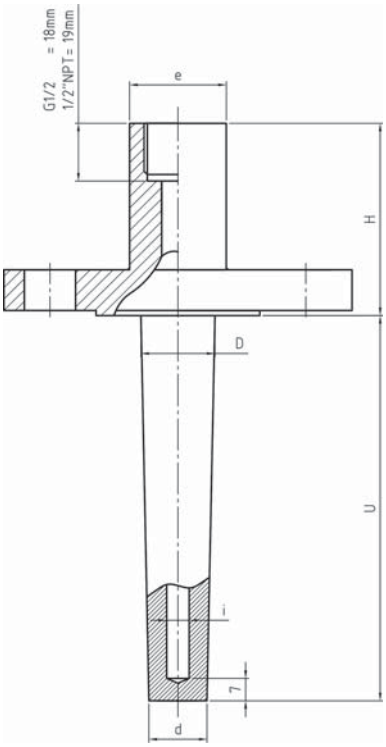
Process connection	Max. total length	AF	F	i	d	D	H	L	Q
G-thread	1000 mm	36	G ¾ B	7-8-9	18	23	46	20	31.7
				10-12	21				
		41	G 1 B	7-8-9	18	29	51	25	39
				10-12	21				

Tapered shank, bar stock/drilled thermowell with
process connection NPT-thread (max. PN 250 at 20 °C)



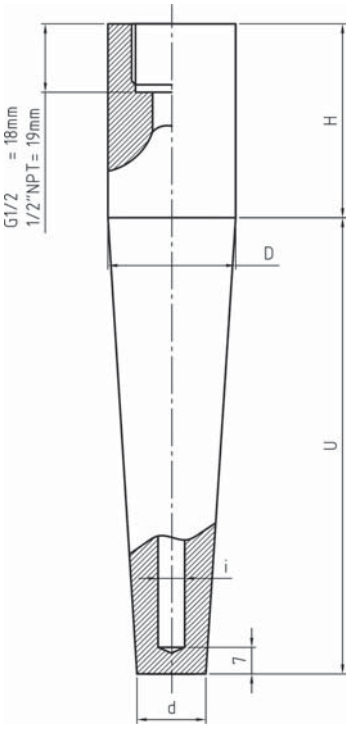
Process connection	Max. total length	AF	F	i	d	D	H	L
NPT-thread	1000 mm	27	¾" NPT	7-8-9	18	23	46	20
				10-12	21			
		36	1" NPT	7-8-9	18	29	51	24
				10-12	21			

Tapered shank, bar stock/drilled thermowell with process connection flange acc. DIN or ANSI (max. PN 250 at 20 °C)



Process connection		Max. total length	i	d	D	H	e
flange	ANSI 1"	1000 mm	7-8-9	18	23	60	30
			10-12	21			
	ANSI 1 ½"		7-8-9	18	29		35
			10-12	21			
	ANSI 2"		7-8-9	18			
			10-12	21			
	DIN DN 25		7-8-9	18	23	60	30
			10-12	21			
	DIN DN 32		7-8-9	18	29		35
			10-12	21			
	DIN DN 40		7-8-9	18			
			10-12	21			
	DIN DN 50		7-8-9	18			
			10-12	21			

Tapered shank, bar stock/drilled thermowell with process connection for weld-on (max. PN 250 at 20 °C)



Process connection		Max. total length	i	d	D	H
for weld-on	DN 1"	1000 mm	7-8-9	18	33.4	51
			10-12	21		
	DN 1 ¼"		7-8-9	18	38.1	51
			10-12	21		

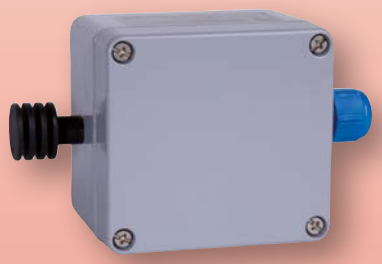
Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Resistance Thermometers according to DIN

Ignition Protection Exia

measuring • monitoring • analysing

TWL-Exia



- Measuring range: -80...+600 °C
- Pt 100-sensor class A respectively class B
- Output: resistance or analogue 4 - 20 mA
- Thermowells according to DIN 43772
- Special sensor length available
- Option: head transmitter with HART® protocol, or PROFIBUS®/Fieldbus
- For ATEX applications, ignition protection Exia

T2

KOBOLD companies worldwide:

ARGENTINA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, DOMINICAN REPUBLIC, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, ROMANIA, SINGAPORE, SOUTH KOREA, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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www.kobold.com

Description

The KOBOLD resistance thermometers model TWL comprise a rugged installation fitting made of stainless steel with thread, flange or weld-on connection, a connection head form B out of aluminium casting and a removable measuring insert (exceptions are models TWL-ST, -SN and -SA). The measuring insert can be replaced without emptying the process (TWL-ST, -SN, -SA excepted). The instruments are supplied with the ignition protection Exia as a standard and therefore can be installed in relevant hazardous areas.

A Pt 100 temperature sensor according to IEC 751, category A or B is fitted in the measuring insert as standard. Depending on customer request the temperature sensor can be carried out as 2-, 3- or 4-wire circuit.

Alternatively these sensors can be designed as single or double resistance thermometers. Exceptional the 4-wire version, which can only be build with one Pt 100 due to lack of space.

As an option the resistance thermometers can be supplied with a head transmitter. Transmitter with a standard 4-20 mA signal and transmitter with HART® protocol or with PROFIBUS®/Fieldbus are there to choose from.

Beside the available resistance thermometers according to DIN-standard, there are customised versions relating to the immersion length, the connection head, the materials, the process connection or the tolerance classes deliverable on request.

Head Transmitter

Resistance thermometers with head transmitter are used whenever a measuring signal must be transported long distance without any disturbance.

The head transmitter which is encapsulated in epoxide resin is located right in the connection head and delivers a temperature-linear output signal of 4-20 mA. The head transmitter is available with standardised communication systems just like HART® protocol or PROFIBUS®/Fieldbus.

Applications

The resistance thermometers are favourably used for the temperature measurement in liquids, solids and gaseous media. The reliable watertightness of this installation method for gauge pressure and vacuum is an important criteria for selection.

Application areas are located in the air-conditioning and cooling industry, the heating-, furnace-, mechanical- and apparatus construction as well as in the complete industry.

For all applications in hazardous areas, the instruments are supplied with the ignition protection Exia.

Technical Data

Meas. principle:	temperature depending resistor
Meas. range:	-80 ... +600 °C, (-40 ... +85 °C TWL-ST)
Sensor:	Pt 100, single- or double-sensor (1 x Pt 100 or 2 x Pt 100)
Accuracy:	class A or class B (others on request)
Ambient temperature:	-40 ... +150 °C (-40 ... +85 °C TWL-ST) with ceramic terminal base -40 ... +85 °C with transmitter -40 ... +85 °C for room temperature sensor
Operating Pressure:	max. 250 bar (depending on TWL version, see order details)
Connection head:	form B with chain except TWL-ST : Aluminium or polycarbonate connection head TWL-SN and TWL-SA: without connection head
Materials:	
- Sensor:	stainless steel 1.4404 (exception: TWL-D and TWL-ST, others on request)
- Neckpipe:	stainless steel 1.4404 (exception: TWL-D, others on request)
- Connection head:	aluminium, painted (TWL-ST: Polycarbonate)
- Terminal base:	ceramic (without transmitter)
Process connection:	thread G ½ male, G1 male flange DN 25 weld-on sleeve Ø 24 h7, others on request
Sensor wiring:	2-, 3- or 4-wire
Protection:	connection head IP 65 sensor IP 68
ATEX-approval:	⟨Ex⟩ II 1 GD Ex ia IIC T4...T6/ Ex iaD 20 IP65 T85 °C -20 °C ≤ Ta ≤ +60 °C
Head transmitter:	
- Output:	analogue output 4-20 mA
- Communication:	HART®-protocol, PROFIBUS®/Fieldbus
- Minimum meas. span:	standard transmitter 25 K transmitter with HART® 10 K transmitter with PROFIBUS®/ Fieldbus™ 5 K
- Supply voltage:	8-35 V_{DC} for standard transmitter and transmitter with HART® 9-32 V_{DC} for transmitter with PROFIBUS®/Fieldbus™

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Screw-in resistance thermometer form 2G with neckpipe, protection Exia, thermowell G ½ male according to DIN 43772 (with neckpipe), p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category[2]	Wiring	Connection head	Head transmitter	Options
TWL-B94	**10** = 100 Ø 8x6 mm **16** = 160 Ø 8x6 mm **25** = 250 Ø 8x6 mm **40** = 400 Ø 8x6 mm **XX**[1] = special length Ø 8x6 mm	**2** = G ½ AG	**1** = 1 x Pt 100 cat. B -80…+600 °C **2** = 2 x Pt 100 cat. B -80…+600 °C **3** = 1 x Pt 100 cat. A -80…+600 °C **4** = 2 x Pt 100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[4] = programmable transmitter 2-wire (5333D) **B**[4] = transmitter with HART® protocol 2-wire (5335D) **C**[4] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

Screw-in resistance thermometer form 2G with neckpipe, protection Exia, thermowell G 1 male according to DIN 43772, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category[2]	Wiring	Connection head	Head transmitter	Options
TWL-CB4	**10** = 100 Ø 10x8 mm **16** = 160 Ø 10x8 mm **25** = 250 Ø 10x8 mm **40** = 400 Ø 10x8 mm **XX**[1] = special length Ø 10x8 mm	**4** = G 1 AG	**1** = 1 x Pt 100 cat. B -80…+600 °C **2** = 2 x Pt 100 cat. B -80…+600 °C **3** = 1 x Pt 100 cat. A -80…+600 °C **4** = 2 x Pt 100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[4] = programmable transmitter 2-wire (5333D) **B**[4] = transmitter with HART® protocol 2-wire (5335D) **C**[4] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

Screw-in resistance thermometer form 3G with neckpipe, protection Exia, tapered thermowell G 1 male according to DIN 43772 for faster response time, p_{max} 30 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category[2]	Wiring	Connection head	Head transmitter	Options
TWL-G94	**16** = 160 Ø 8x6 mm **25** = 250 Ø 8x6 mm **28** = 280 Ø 8x6 mm **XX**[1] = special length Ø 8x6 mm	**4** = G 1 AG	**1** = 1 x Pt100 cat. B -80…+600 °C **2** = 2 x Pt100 cat. B -80…+600 °C **3** = 1 x Pt100 cat. A -80…+600 °C **4** = 2 x Pt100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[4] = programmable transmitter 2-wire (5333D) **B**[4] = transmitter with HART® protocol 2-wire (5335D) **C**[4] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

Immersion resistance thermometer form 1, protection Exia, thermowell according to DIN 43772 with adjustable flange, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category[4]	Wiring	Connection head	Head transmitter	Options
TWL-1F4	**50** = 500 Ø 15 mm **71** = 710 Ø 15 mm **1T** = 1000 Ø 15 mm **T4** = 1400 Ø 15 mm **2T** = 2000 Ø 15 mm **XX**[1] = special length Ø 15 mm	**B** = adjustable G ¾ male st.st. **C** = aluminium sliding flange DIN 43743	**1** = 1 x Pt100 cat. B -80…+600 °C **2** = 2 x Pt100 cat. B -80…+600 °C **3** = 1 x Pt100 cat. A -80…+600 °C **4** = 2 x Pt100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[4] = programmable transmitter 2-wire (5333D) **B**[4] = transmitter with HART® protocol 2-wire (5335D) **C**[4] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

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Weld-on resistance thermometer form 4, protection Exia, thermowell according to DIN 43772, p_{max} 250 bar

Model	Immersion length EL / L [mm]	Process connection	Sensor type/ category[3]	Wiring	Connection head	Head transmitter	Options
TWL-D	**1406** = 65/140 (D1) st.st. 1.4571 **2412** = 125/200 (D2) st.st. 1.4571 **4406** = 65/200 (D4) st.st. 1.4571 **5412** = 125/260 (D5) st.st. 1.4571 **XXXX**[1] = special length **1906**[2] = 65/140 (D1) st.st. 1.4903 **2912**[2] = 125/200 (D2) st.st. 1.4903 **4906**[2] = 65/200 (D4) st.st. 1.4903 **5912**[2] = 125/260 (D5) st.st. 1.4903 **XXXX**[1] = special length	**0** = weld-on	**1** = 1 x Pt 100 cat. B -80…+600 °C **2** = 2 x Pt 100 cat. B -80…+600 °C **3** = 1 x Pt 100 cat. A -80…+600 °C **4** = 2 x Pt 100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[4] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[5] = programmable transmitter 2-wire (5333D) **B**[5] = transmitter with HART® protocol 2-wire (5335D) **C**[5] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Stainless steel 1.7380 or 1.7337 on request
[3] Maximum temperature +750 °C on request
[4] Only with 1x Pt100
[5] Please specify measuring range in writing

Insertion resistance thermometer form 3F, protection Exia flange DN 25 PN 40, tapered thermowell according to DIN 43772 for faster response time, p_{max} 50 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category[2]	Wiring	Connection head	Head transmitter	Options
TWL-F94	**22** = 225 (size ø12 ... 8 mm) **28** = 285 (size ø12 ... 8 mm) **34** = 345 (size ø12 ... 8 mm) **XX**[1] = special length	**4** = DN 25	**1** = 1 x Pt 100 cat. B -80…+600 °C **2** = 2 x Pt 100 cat. B -80…+600 °C **3** = 1 x Pt 100 cat. A -80…+600 °C **4** = 2 x Pt 100 cat. A -80…+600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**G** = form B, with chain **Y** = special connection head (to be specified in writing)	**0** = without **A**[4] = programmable transmitter 2-wire (5333D) **B**[4] = transmitter with HART® protocol 2-wire (5335D) **C**[4] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

Spare measuring insert for resistance thermometer according to DIN 43772 and protection Exia

Model	Immersion length ML [mm]	For form	Measuring insert length	Sensor type/ category[2]	Wiring	Head transmitter	Options
TWL-M82 **Ø 8 mm**	**0050** = 500 **0071** = 710 **001T** = 1000 **00T4** = 1400 **002T** = 2000 **XXXX**[1] = special length	1	528 738 1028 1428 2028 acc. to special length	**1** = 1 x Pt100 cat. B -80… +600 °C **2** = 2 x Pt100 cat. B -80… +600 °C **3** = 1 x Pt100 cat. A -80… +600 °C **4** = 2 x Pt100 cat. A -80… +600 °C	**2** = 2-wire **3** = 3-wire **4**[3] = 4-wire	**0** = without **A**[3] = programmable transmitter 2-wire (5333D) **B**[3] = transmitter with HART® protocol 2-wire (5335D) **C**[3] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description
TWL-M62 **Ø 6 mm**	**0010** = 100 **0016** = 160 **0025** = 250 **0040** = 400 **XXXX**[1] = special length	2G (Model TWL-CB4 only)	258 318 408 558 acc. to special length				
TWL-M52 **Ø 5 mm**	**0010** = 100 **0016** = 160 **0025** = 250 **0040** = 400 **XXXX**[1] = special length	2G (Model TWL-B94 only)	258 318 408 558 acc. to special length				
	0022 = 225 **0028** = 285 **0034** = 345 **XXXX**[1] = special length	3F	318 378 438 acc. to special length				
	0016 = 160 **0025** = 250 **0028** = 280 **XXXX**[1] = special length	3G	318 408 438 acc. to special length				
	1406 = 65/140 **2412** = 125/200 **4406** = 65/200 **5412** = 125/260 **1906** = 65/140 **2912** = 125/200 **4906** = 65/200 **5912** = 125/260 **XXXX**[1] = special length	4	322 382 382 442 322 382 382 442 acc. to special length				

[1] Please specify special length in writing
[2] Maximum temperature +750 °C on request
[3] Only with 1x Pt100
[4] Please specify measuring range in writing

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Ambient resistance thermometer, protection Exia, p_{max} Atmospheric pressure

Model	Sensor length "EL"	Process connection	Sensor type/ category	Wiring	Connection head	Head transmitter	Special option
TWL-ST	**24** = 24 mm **XX**[1] = special length	**0** = wall mounting	**1** = 1 x Pt100 cat. B **2** = 2 x Pt100 cat. B **3** = 1 x Pt100 cat. A **4** = 2 x Pt100 cat. A	**2** = 2-wire **3**[4] = 3-wire **4**[2] = 4-wire	**P** = polycarbonate **A** = aluminium	**0** = without **A**[3] = programmable transmitter 2-wire (5333D) **B**[3] = transmitter with HART® protocol 2-wire (5335D) **C**[3] = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	**0** = without **Y** = acc. description

[1] Please specify special length in writing [2] Only with 1x Pt100 [3] Please specify measuring range in writing [4] Necessary for head transmitter

Screw-in resistance thermometer with cable, protection Exia, male according to DIN 43772, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category	Wiring	Connection cable[3]	Head transmitter	Special option
TWL-SN	**10** = 100 Ø 6 mm **16** = 160 Ø 6 mm **25** = 250 Ø 6 mm **40** = 400 Ø 6 mm **XX**[1] = special length	**2** = G ½ male	**1** = 1 x Pt100 cat. B -80…+600°C **2** = 2 x Pt100 cat. B -80…+600°C **3** = 1 x Pt100 cat. A -80…+600°C **4** = 2 x Pt100 cat. A -80…+600°C	**2** = 2-wire **3** = 3-wire **4**[2] = 4-wire	**S** = silicone cable **P** = PTFE cable **X** = special length and/or material (to be specified in writing)	**0** = without	**0** = without **Y** = acc. description

[1] Please specify special length in writing [2] Only with 1x Pt100 [3] Please specify special length cable 'CL' (standard model 1000 mm) in writing

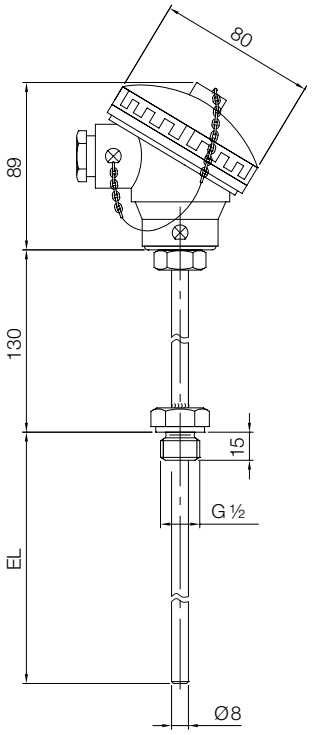
Insertion resistance thermometer with cable, protection Exia, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category	Wiring	Connection cable[3]	Head transmitter	Special option
TWL-SA	**10** = 100 Ø 6 mm **16** = 160 Ø 6 mm **25** = 250 Ø 6 mm **40** = 400 Ø 6 mm **XX**[1] = special length	**0** = ohne	**1** = 1 x Pt100 cat. B -80…+600°C **2** = 2 x Pt100 cat. B -80…+600°C **3** = 1 x Pt100 cat. A -80…+600°C **4** = 2 x Pt100 cat. A -80…+600°C	**2** = 2-wire **3** = 3-wire **4**[2] = 4-wire	**S** = silicone cable **P** = PTFE cable **X** = special length and/or material (to be specified in writing)	**0** = without	**0** = without **Y** = acc. description

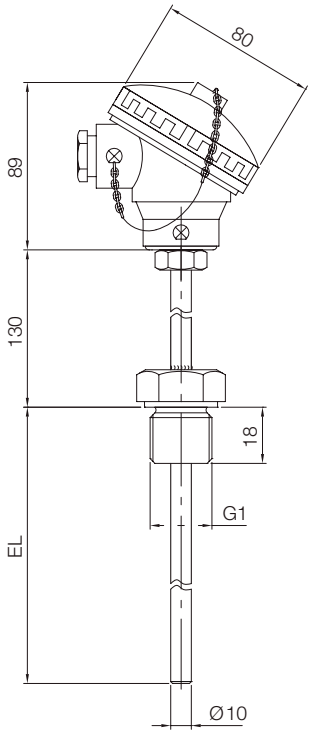
[1] Please specify special length in writing [2] Only with 1x Pt100 [3] Please specify special length cable 'CL' (standard model 1000 mm) in writing

Dimensions [mm]

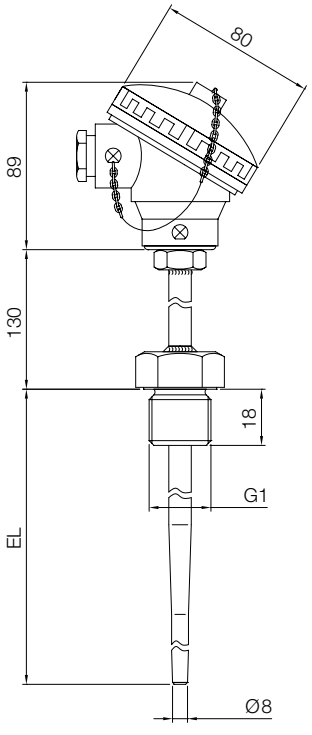
TWL-B…



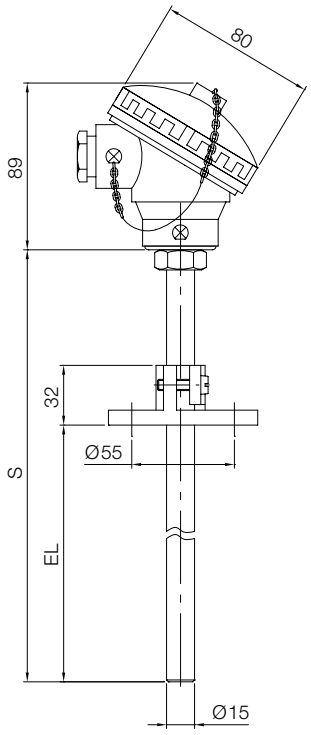
TWL-C…



TWL-G…



TWL-1F…



EL = immersion length S = overall probe length

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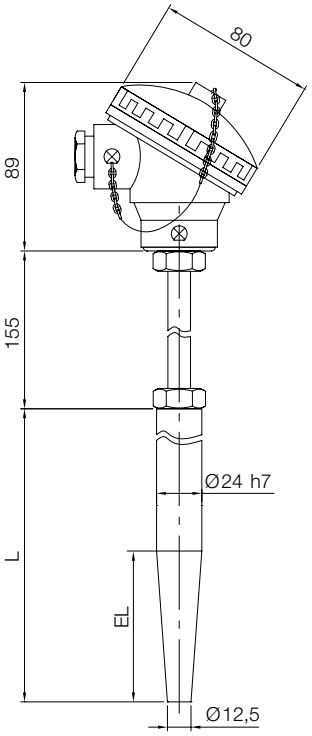
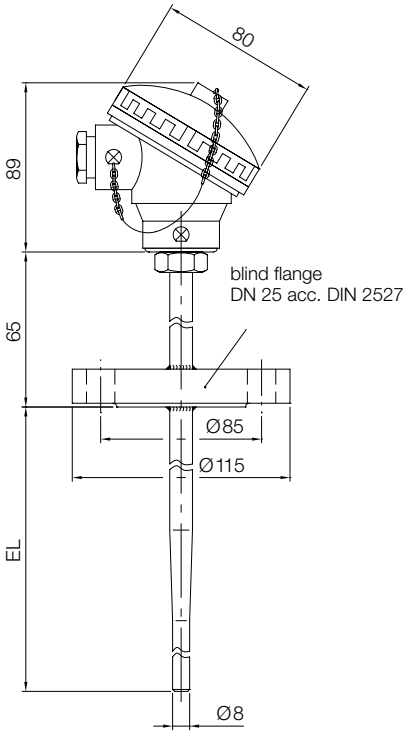
Dimensions [mm]

TWL-D…

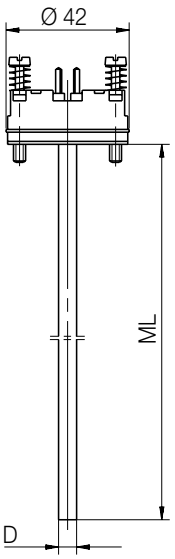


TWL-F…



L = overall length weld-on probe
EL = immersion length

TWL-M…

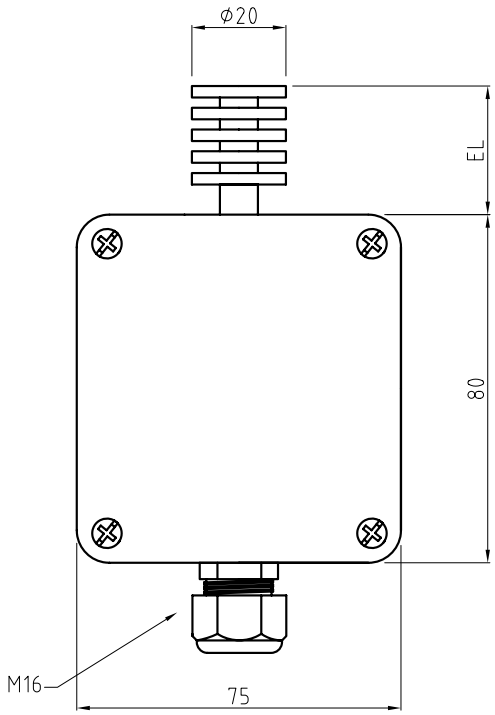


Diameter D	
…M82…	8 mm
…M62…	6 mm
…M52…	5 mm

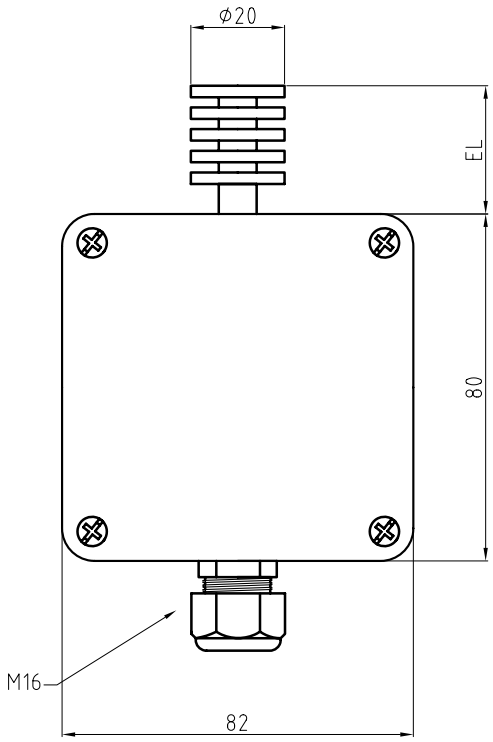
ML = length measuring insert

Dimensions [mm]

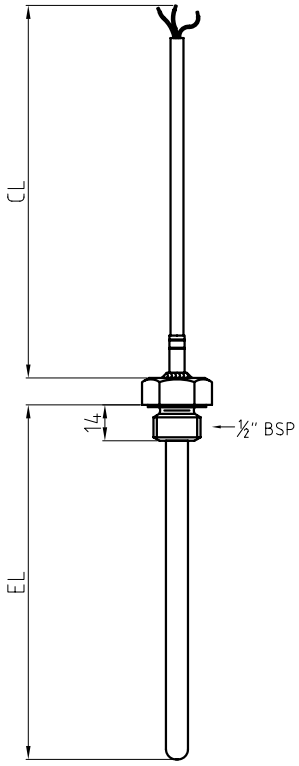
TWL-ST240…A...



TWL-ST240…P...



TWL-SN…



TWL-SA…